Examiner Suggestions

Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of depositing a MgO film on a large area including a power control part to apply a voltage and an electric current ~~separately~~ to at least one magnesium target, the method comprising:

See Spec, para [0033]

applying a voltage to the magnesium target by the power control part;

applying an electric current to the magnesium target by the power control part to increase power on the magnesium target when the ~~applied~~ voltage on the magnesium target stops increasing in response to an increase in the applied voltage; and

forming a MgO film on a substrate using magnesium particles emitted from the magnesium target.

2. (Cancelled)

3. (Original) The method of claim 1, wherein the voltage applied to the at least one magnesium target is between 250V and 300V when the voltage stops increasing.

4. (Original) The method of claim 1, wherein the current applied to the at least one magnesium target increases until the power applied to the at least one magnesium target is saturated.

5. (Original) The method of claim 4, wherein the saturated power has a frequency between 10 kHz and 100 kHz.

6. (Original) The method of claim 4, wherein the duty ratio of the saturated power is between 30% and 60%.

7. (Previously Presented) An apparatus to deposit a MgO film within a large area comprising:

a magnetron part comprising at least one magnesium target and a permanent magnet positioned on one side of the magnesium target;

See Spec., para [0033]

a power control part to apply a voltage and an electric current ~~separately~~ to the magnesium target, the power control part applying the voltage and subsequently applying the current when the voltage on the magnesium target stops increasing when the applied voltage increases;

a flow control part to supply gases to the magnesium target;

a substrate control part to control a substrate on which magnesium oxides are deposited;

a vacuum control part to control a vacuum state in a chamber in which the MgO film is deposited on the substrate; and

a heater control part to maintain a temperature in the chamber.

8. (Cancelled).

9. (Original) The apparatus of claim 7, wherein the power control part operates under conditions between 10 kHz and 150 kHz in frequency, between 10% and 90% in duty ratio, less than 500 V in output voltage, and between 1 A and 50 A in output current.

10. (Original) The apparatus of claim 7, wherein the gases supplied to the magnesium target include oxygen and argon.

11. (Original) The apparatus of claim 7, wherein the flow control part comprises an oxygen flow regulator, an argon flow regulator, cut-off valves to block off gas flow to the magnesium target, and a gas supply line to supply the magnesium target with the gases.

12. (Original) The apparatus of claim 7, wherein the substrate control part supports the substrate using a substrate-supporting member and adjusts movement speed of the substrate.

13. (Original) The apparatus of claim 7, wherein the vacuum control part comprises a vacuum pump, a vacuum gage and a pressure regulator.

14. (Original) The apparatus of claim 7, wherein the heater control part maintains temperature in the vacuum chamber between 100℃ and 200℃ and is distanced from the substrate by a spacing between 5 cm and 10 cm.

15. (Original) The apparatus of claim 7, wherein the heater control part comprises a separate power supply independent of the power control part.

16. (Previously Presented) The method of claim 1, wherein the electric current is a negative square wave.

17. (Previously Presented) The method of claim 7, wherein the electric current is a negative square wave.

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vacuum chamber 51 is adjusted between 5 mTorr and 10 mTorr by a pressure regulator. The vacuum chamber 51 is preferably made of aluminum or stainless steel. The vacuum gage 53 may be any type of vacuum gage capable of measuring a vacuum state as well as a Baratron gage.

[0031] The heater control part maintains temperature in the vacuum chamber 51 uniformly and controls heating for the substrate 41. In detail, a heater 61 is positioned in a predetermined location with a spacing preferably between 5 cm and 10 cm from the backside of the moving PDP and the temperature in the vacuum chamber 51 is maintained between 100℃ and 200℃. The heater control part has a separate heater power supply 62 independent of the power control part 20 in order to operate the heater 61. The heater 61 may be a heater by radiation heating such as a halogen lamp heater, as well as a heater by resistance heating.

[0032] A method of depositing a MgO film on a large substrate area is now described.

Use language in this para to better define claims

[0033] The spacing between the PDP and the magnesium target 11 is adjusted preferably between 4 cm and 7 cm. When a voltage is applied to the magnesium target 11, a reactive sputtering process begins and magnesium particles emitted from the magnesium target 11 combine with oxygen. The resulting magnesium oxide is then deposited on the surface of the PDP. The sputtering discharge is generated in the vacuum chamber and in this state the voltage in the magnesium target 11 does not increase anymore although the power supply applies higher voltages. At this time, the voltage at the magnesium target 11 is between 250V and 300V. Thereafter, a current application controller of the power supply is operated to apply a higher current to the magnesium target 11 until the power applied to the magnesium target 11 is saturated. The saturation point of the power applied is when intermittent sparks occur on the surface of the magnesium target 11 and then an oscilloscope shows a deformed waveform of current. If a higher current is applied, the voltage at the magnesium target 11 again increases and, finally, maximum voltage and current are applied to the magnesium target 11. As a result, a maximum power is applied to the magnesium target 11, maximizing the MgO film growth speed proportional to the power applied. When the power supply applies the maximum power to the magnesium target 11, the frequency used is between 10 kHz and 100 kHz and the duty ratio is between 30% and 60%.

[0034] Fig. 5 shows examples of voltage and current waveforms when two magnesium targets 11 are connected to two power supplies respectively. Here, the power supplies 1 and 2, operate respectively at 25 kHz and 50 kHz in frequency under conditions of 200 V/div, 20 A/div, and 20 μs/div. From the top, the first and the second waveforms are respectively voltage and